Nov. 21, 1939. J. E. OYS ET AL 2,180,606

SPRAYER CONSTRUCTION AND COVER CLAMPING DEVICE

Filed Nov. 6, 1936 2 Sheets-Sheet 1

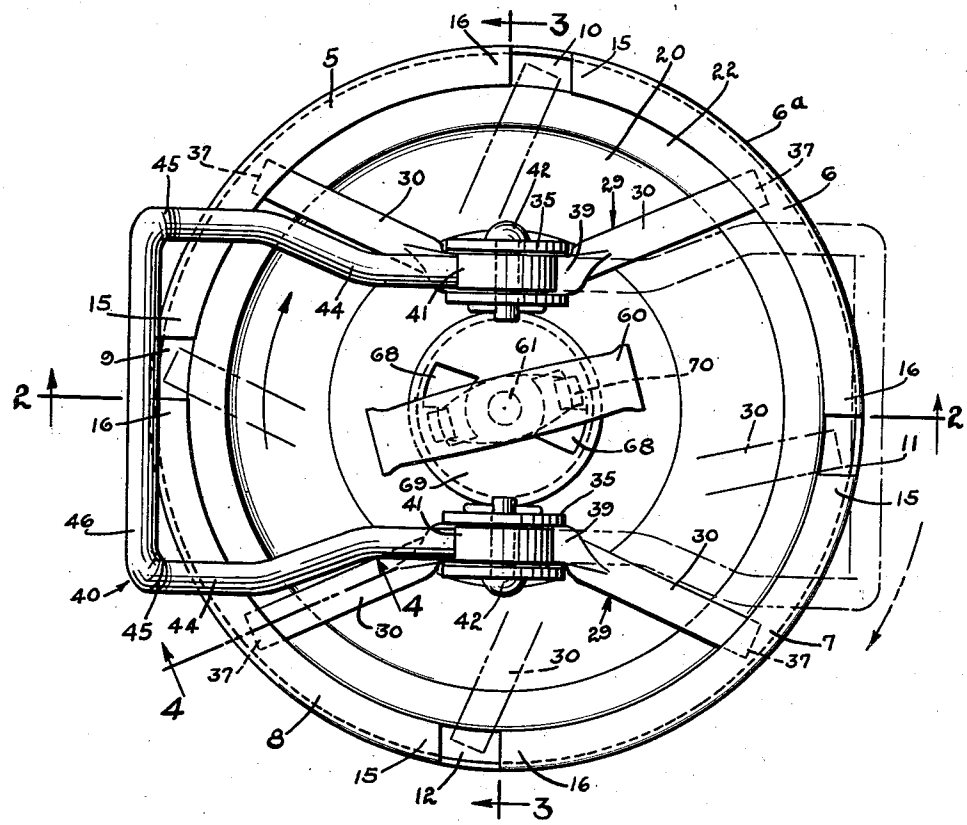


Fig.1

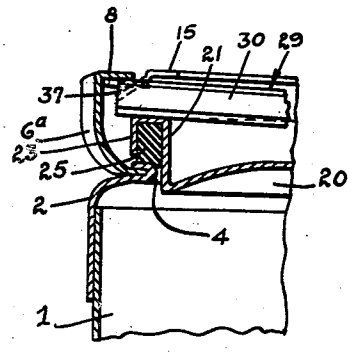


Fig.4

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SPRAYER CONSTRUCTION AND COVER CLAMPING DEVICE

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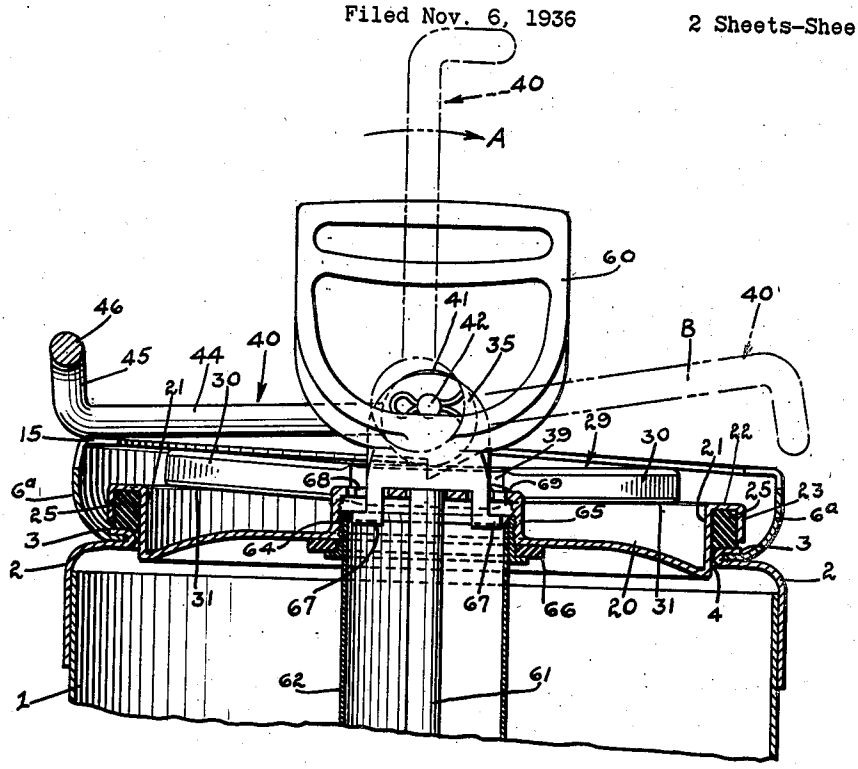


Fig.2

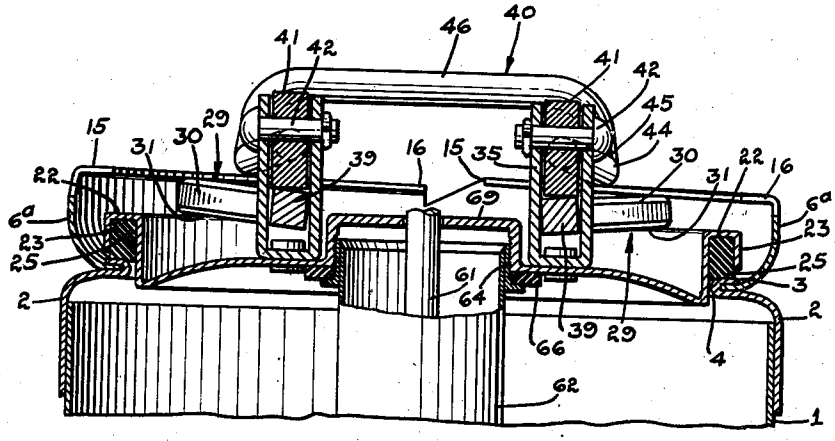


Fig.3

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UNITED STATES PATENT OFFICE

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SPRAYER CONSTRUCTION AND COVER CLAMPING DEVICE

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Application November 6, 1936, Serial No. 109,538

4 Claims. (Cl. 220—57)

This invention relates to improvements in sprayers and the invention is applied to that type of sprayer comprising an elongated vertical spray tank having a cap or closure, to which a pump is attached which cap and pump are adapted to be removed when it is desired to fill the tank with spraying liquid.

The principal objects of the invention are to provide a means for unfailingly obtaining adequate pressure-tight seal between the cap or closure and seat of the receptacle, and to provide a very relatively simplified construction for this purpose which permits the use of a closure element the diameter of which is almost as great as the diameter of the tank.

Another object of the invention is to provide a lever which fulcrums on the cover and which is rocked by means of a power-applying element which also serves as a bail for carrying the tank, and which is used as an arm giving an increased leverage by which to rotate the cover either for the purpose of bringing the locking means to locking position or for bringing the cover to a position to allow its removal from the tank.

Features of the invention include: the use of a lever having a fulcruming point on the cover and the use of means on the cover for controlling the lever; the use of two levers each of which has two fulcruming points on the cover and the use of a bail having plural means for operating respective levers; the arrangement of a bail to swing over the middle of the tank diametrically thereto for lifting the cover or the tank, and independently of the cover clamping means; the use of a combination bail and the eccentric camming means, for initially rotating the cover to obtain preliminary camming action of the levers; and all details of construction shown, along with the broader ideas of means inherent in the disclosure.

Objects, features and advantages of the invention will appear in the description of the drawings, and in said drawings,

Figure 1 is a top plan view showing the device in locked condition and showing (in dot-and-dash lines) the lever bars so positioned as to allow removal of the cover;

Figure 2 is a vertical section taken substantially on line 2—2 of Figure 1;

Figure 3 is a vertical section taken substantially on line 3—3 of Figure 1; and

Figure 4 is a detail section further illustrating the lever action and taken approximately on line 4—4 of Figure 1.

In the drawings, numeral 1 indicates the body or tank which in practice is vertically elongated, and is generally two feet or more in height. The bottom of the can acts as a base, when filling, and in use the tank is carried by a shoulder strap.

Suitably secured to the top of the tank is an annular element 2 having a turned-over portion 3 defining a smooth-edged filling opening 4. Clampingly engaged by the turned-over portion is the lower portion of a ring 6a provided at its top with four circumferentially arranged flanges respectively indicated 5, 6, 7 and 8, which provide wedging surfaces, overhanging or opposed to the seat 3. The flanges are spaced to provide openings 9, 10, 11 and 12 downwardly or upwardly through which the ends of rock bars, later described, can pass. The under surfaces of these flanges provide spiral wedging surfaces, the ends 15 being at the higher level than the ends 16, so that a clockwise rotation of the cover causes its rock bars to be wedged by said surfaces, to clamp the cover against its seat. There is no intention to be limited by the use of these wedging surfaces although they are claimed in some instances in combination with the broader feature relating to rock-bar locking. These surfaces are however a valuable adjunct in relation to the rock-bar cover-sealing means.

The numeral 20 indicates the cover or closure for the opening 4 and comprises a disc providing an upstanding flange 21, merging into a horizontal portion 22, in turn merging into a depending portion 23, forming a socket. In the socket is disposed a washer 25, which is adapted to engage the over-turned part 3 as a seat, to form a pressure-tight seal. It is noted that fulcruming pressure is applied lengthwise of the flange 21, which flange projects downwardly through the opening 4 as shown. This is a feature of the invention.

Mounted on the cover is a pair of bars 29 each having two arms 30, or that part of the bar disposed inwardly from the fulcrum points may be considered a single long arm of the lever. The outer lower sides of each arm engage the part 22 of the cover as a fulcrum as indicated at 31, and the upper outer ends of the bars respectively engage beneath the flanges 5, 6, 7 and 8. The middle or long arm portion 39 of each lever-bar is slidably received within a U-shaped guide 35. The guides are diametrically disposed at opposite sides of the center of the cover. It will be seen that when power is applied downwardly against the middle portion 39 of a bar, its outer short arm portions 37 move upwardly against one of the flanges 5, 6, 7 or 8, the fulcrum point being at 21, the short arm 37 of the bar extending from

this point outwardly, and the long arm extending from this point inwardly to the point of application of power. Thus a very powerful leverage is obtained and this is increased by eccentric camming action of the bail or its equivalent

In this embodiment two bars and two U-shaped guides have been provided, but it is conceivable that a single lever could be used and such a use is contemplated. An important phase of the invention is the use of the lever, and the taking advantage of the lid as a fulcrum point, and of some part or parts on the tank, for example, the flanges 5, 6, 7 and 8 as power points, to lever-press the lid into sealing relation with the seat 3.

A feature of this invention is the use of a bail 40 having at the end of each arm 44, a power wedge or eccentric 41, the periphery of which is adapted to engage the middle portion 39 of the corresponding lever-bar. The pivots for the eccentrics are indicated at 42, see Figure 3, in which figure the eccentrics are shown in power-applying position. The outer end of the bail is bent upwardly or at right angles to the arms 44 of the bail, as at 45. The handle 46 when in locking position lies substantially at a point over the wedging flanges, and is spaced upwardly to prevent injury to the fingers during forceful manipulation of the bail. The bail is used as a handle or lever for rotating the cover to preliminarily force the cover toward its seat by the camming or wedging action of the outer or short arms, on the wedging flanges 5, 6, 7 and 8, it being noted that this preliminary wedging action raises the middle portions 39 of the levers, so that they are spaced upwardly from the bottoms of the guides, and thus clearance is provided for down movement under the action of the camming eccentrics.

Operation

Assuming the lid to have just been dropped into position against its seat, and the arms to be in the dot-and-dash line position of Figure 1, (having just dropped through the openings 9, 10, 11 and 12), with the bail occupying the vertical dot-and-dash line position shown. The operator now swings the bail in direction of the dot-and-dash line arrow A, or in a direction to so dispose the eccentrics as to allow the long arms of the bars to rise. The bail is brought approximately to dot-and-dash line position B. Using the bail as a leverage arm, the operator now moves it in clockwise direction through an arc of say 22°, bringing the ends 37 of the bars to the wedging position shown in full lines in Figure 1. The operator pulls with some force so as to take advantage of the camming actions of the spiral cams 5, 6, 7 and 8 to obtain as great a compression and sealing as is possible by this means. Then the handle is grasped and moved from the dot-and-dash line position B of Figure 1 to the full line position, depressing the middle portions 39 of and rocking the bars. This movement of course causes the levers to swing around the points 31 to bring their outer ends 37 more strongly against the flanges 5, 6, 7 and 8, whereby to positively unfailingly obtain a seal between cover and tank. The four point application of power in this manner is a feature.

Another feature of the invention relates to the arrangement whereby the bail is so constructed and proportioned as to be capable of swinging over the pump operating handle indicated at 60, so that it bridges the handle, as shown in Figure 2. This handle is connected to the piston stem 61. The pump barrel is indicated at 62 and is suitably detachably secured as by threading 64 to an upstanding dome or recess 65, a washer 66 being interposed as shown for sealing. The handle has depending lugs with outstanding fingers 67 which are capable of registering, see Figure 1, and passing through openings 68 in the top 69 of the dome 65. If after passage through these openings, the handle is given a turn in counterclockwise direction, these lugs are brought to a position beneath flanges 70, so that up-pull on the handle will result in lifting of the whole device, if the lid is locked, or in lifting the lid if the same is unlocked, and if the arms are in register with openings 9, 10, 11 and 12. It is also noted that the bail can act as a carrying member and of course may be used with any suitable type of sprayer whether it is provided with a handle carrying means or not. The stem 61 is slidable through an opening of the dome 65 and is of course suitably connected with the handle 60.

We claim as our invention:

1. A tank having a filling opening having a seat, a cover for the opening which is to be pressed into sealing relation with the seat, a lever fulcruming on the cover at two points and having outer arms to engage with portions of the tank, and means attached and movable relatively to the cover, and adapted to act on the lever at a point between the fulcrum points, to rock the lever and cause the cover to be pressed against the seat.

2. A tank having a filling opening having a seat, a cover for the opening which is to be pressed into sealing relation with the seat, a lever fulcruming on the cover at two points and having outer arms to engage with portions of the tank, and means pivotally attached and movable relatively to the cover and adapted to act on the lever at a point between the fulcrum points to rock the lever about said points to move the outer arms to cause the cover to be pressed against the seat.

3. A tank having a filling opening having a seat, a cover for the opening which is to be pressed into sealing relation with the seat, a lever fulcruming on the cover and having an outer arm to engage with a portion of the tank, and a tank-carrying bail pivotally attached to the cover and having means adapted to act on the inner arm of the lever to rock the lever about the cover-fulcrum whereby to cause the cover to be pressed against the seat, the bail being so related to its lever-rocking means that when the latter is in lever-rocked position the bail is positioned for carrying the tank.

4. A tank having a filling opening having a seat, a cover for the opening which is to be pressed into sealing relation with the seat, said cover having a raised peripheral rim, a lever fulcruming on the rim at two points and having outer arms which engage with portions of the tank, a bail pivoted to the cover and having means adapted to act at a point between the fulcrum points to rock the lever and cause the cover to be pressed against the seat.

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